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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 08/634,255 | 04/18/1996 | NORIO OHKUMA | 35.C11365 | 9044 |

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| EXAMINER | |
|---|---|
| BROOKE, MICHAEL S | |
| **ART UNIT** | **PAPER NUMBER** |
| 2853 | |

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 08/634,255 | OHKUMA ET AL. | |
| | Examiner | Art Unit | |
| | Michael S. Brooke | 2853 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2 and 4-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claims 1, 2 and 4-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma et al. (U.S. 5,478,606) in view of Nakahata et al. (5,166,265).**

Ohkuma et al. discloses a liquid jet recording head which includes a member formed from a cured product of a resin composition comprising an epoxy and a photopolymerization initiator which acts to cure the epoxy (see column 5, lines 35-60). The epoxy compound is an aromatic epoxy compound such as bisphenol A (see column 5, lines 35-36). The curable epoxy compound disclosed also includes an alicyclic epoxy having an oxycyclohexane skeleton (see column 5, lines 35-42). The reference also discloses a method of making the liquid jet recording head which entails forming an ink flow path pattern form a soluble resin on an ink discharge pressure-generating element on a base plate, forming a coating resin layer on the soluble resin layer, removing of the soluble resin layer by elution, and forming a discharge opening through the coating resin layer (see column 2, lines 28-42). In addition, the reference discloses that the method of forming the discharge opening is accomplished by the well known technique of photolithography (see column 4, lines 28-32). Finally, Ohkuma et al. discloses in column 7, lines 29-30 that the discharge openings can be formed by either oxygen plasma etching or excimer laser etching.

Ohkuma et al. discloses the claimed invention with the exception of a compound having a functional group reactive to the curable epoxy compound and a fluorocarbon

moiety, wherein the epoxy compound and the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety are polymerized, the fluorocarbon moiety being contained in the resin composition at an amount ranging from 5% to 50% by weight, the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety containing fluorine in an amount of 20% to 80% by weight, the functional group being a hydroxyl group and the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety having a general formula as expressed in claims 6 and 7.

Nakahata et al. teaches (col. 2:7-39) an epoxy resin composition comprising (A) a hydroxyl group containing compound, (B) an epoxy group containing compound, (C) a compound containing a hydrolyzable group directly attached to a silicon atom and /or silanol group and at least one of the above compounds being a fluorine containing resin. Furthermore, the above describes composition also contains a metal chelate as a curing catalyst. Since the metal ions used in the curing process inherently have a positive charge, the polymerization reaction initiated by the metal ions would inherently be a cationic reaction. Nakahata et al. further teaches the compounds in the claimed amounts. The hydroxyl group containing a fluorine moiety, which is analogous to compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety, is contained in the amount of 20% to 80% (col. 44:22-25). Furthermore, Table 1 teaches that the hydroxyl containing compound, which is the compound having a functional group reactive to the curable epoxy compound, is given by the formula $CH_2=CHO(CH_2)_4OH$. This compound has an atomic weight of 116.

Table 1 also teaches the fluorine moiety is given by the formula $CF_2= CF_2$. This compound has an atomic weight of 100. Thus, the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety has a total atomic weight of 216. Fluorine has an atomic weight of 19. Therefore, the total amount of fluorine contained in the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety has an atomic weight of 76. This weight divided by the total weight of 216 gives 35% fluorine in the compound having a functional group reactive to the curable epoxy compound and a fluorocarbon moiety. This epoxy resin composition has the advantages numerous advantages, including improved chemical stability, reduced shrinkage and excellent resistance to environmental conditions (col. 49:3-59 and co. 50:1-5).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Ohkuma et al. with the resin composition of Nakahata et al. for the purpose of providing a hydrophobic ink jet print head having an ink channel with improved chemical stability and resistance to environmental conditions, as taught by Nakahata et al.

At the time the invention was made, it would have been obvious to one of ordinary skill in the ink jet art to provided a compound having a functional group reactive to the epoxy compound, as given by the general formulas of claims 6 or 7, because the Applicant has not disclosed that a compound having one of these particular formulas solves any stated problem or is for any particular purpose. It appears that the invention would perform equally well with the one of the hydroxyl groups and fluorocarbon

moieties taught in Nakahata et al., because both the compounds described in the formulas of claims 6 and 7 and the compounds taught in Nakahata et al. are used to form a hydrophobic resin. Therefore, it would have been obvious to one of ordinary skill in the ink jet art to modify Ohkuma et al., as modified, to obtain the invention as claimed in claims 6 and 7.

***Response to Arguments***

Applicant's arguments filed 12/31/03 have been fully considered but they are not persuasive.

Applicant's argues that the resin of Nakahata et al. would exfoliate. The Applicant has not presented any evidence in support of this position. It is suggested that the Applicant submit a 1.132 Declaration showing that the resin of Nakahata would exfoliate in an ink channel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. Brooke whose telephone number is (571) 272-2142. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (572) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael S. Brooke
Examiner
Art Unit 2853

MSB
02/18/04